

Research Progress Report

Program: VDACS – Specialty Agriculture Research Grant – FY06

Project Title: Viability of Jalapeno, Habanero and Tomatillo Production in Virginia

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Project Description

The agricultural landscape in Southern Virginia is changing as a result of the tobacco buyout and loss of the quota system. Large shifts in tobacco acreage are occurring, leaving some growers without contracts and hence farm generated income. Furthermore, other agricultural commodities in Virginia have suffered due to the loss of local processing markets and/or increased competition among regional/national sources and is reinforcing the need for growers to diversify to keep pace with the changing agricultural/economic climate. This research has been initiated to study the potential for specialty pepper and tomatillo production in Southside Virginia through a partnership with a commercial vegetable buyer (America's Harvest). This presented a unique situation where a market had been secured; however, production specifics for Virginia needed to be explored.

Therefore, the main objectives for this project are to 1) assist growers in adopting alternative crops as part of farm diversification, 2) develop production budgets to determine economics for cost of production and potential returns and 3) test the performance of methyl bromide alternative soil fumigants for use in pepper and tomatillo production.

Progress to Date

On-Farm Studies

Farms located in Brunswick, Lunenburg, Nottoway and Halifax counties were selected as suitable sites based on soil type, proximity to water and shipping routes and previous successful collaborative relationships with the research station. Each farm test includes a soil fumigation trial on all three crops as well as commercial test plantings. One acre of jalapeno, habanero and tomatillos were planted on each farm. The total on-farm project consists of approximately **14 acres**.

Land preparation-

Soil at each location was amended with lime to adjust pH to 6 – 6.5. Fertilizer was applied at a rate of 1000 pounds/A of 6-12-18.



Figure 1. Fertilizer being spread by SPAREC personnel.

Soil samples were taken from plots of the fumigation trial to quantify the nematode population level. Additional samples will be taken at the end of the season to assess the influence of different soil fumigants on the occurrence of nematodes.



Figure 2. Soil cores were collected to quantify nematode populations in plots where methyl bromide alternatives are being tested. 72 samples were collected from each farm.

Soil fumigation for the commercial planting and fumigation trial began on April 21, 2006 at the Lunenburg farm and finished on May 3, 2006 at the Brunswick farm. Southern Piedmont supplied the bed shaper, tractor and personnel.



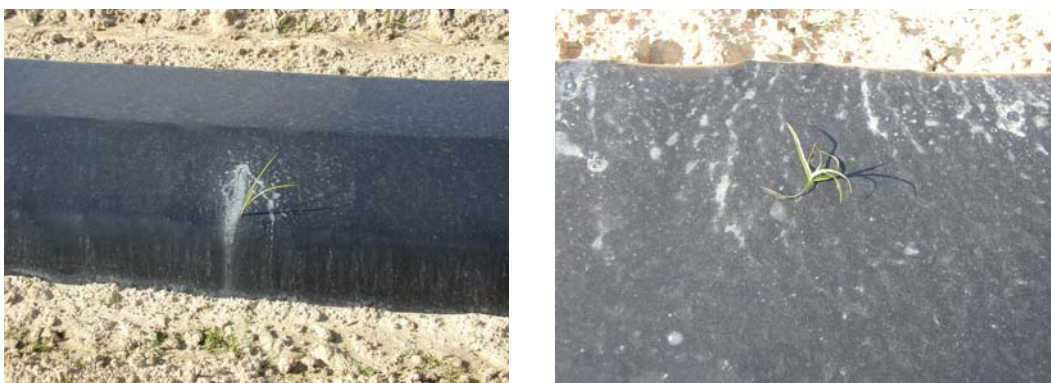
Figure 3. Soil was gassed with Pic-Plus in the commercial plots (left) and Jeff Bridgman of SPAREC applies Vapam with a back pack sprayer in the fumigation trial.

Table 1. Methyl bromide alternatives tested on-farm

Fumigant	Rate	Cost/A (\$)
Methyl bromide	180lbs/A	530
Pic-Plus	150lbs/A	398
Telone C-35	18gal/A	
Vapam	50gal/A	
Vapam + Pic-Plus	50gal/A +150lbs/A	
Untreated Control	NA	0

Observations on alternative fumigants-

Weed control, particularly yellow nutsedge, appears to be significantly less efficacious in the UTC and Pic-Plus treated plots as compared to methyl bromide. No preplant herbicides were used (due to equipment and time constraints); however, both peppers and tomatillos have labeled products for use in weed control under black plastic mulch.



Planting-

Vegetable transplants (>200,000) were propagated by Aaron's Creek Farms in Buffalo Junction, VA. Planting began at the Lunenburg farm on May 18, 2006 and was completed at the Halifax farm on June 2, 2006. Southern Piedmont supplied a water wheel transplanter, tractor for transplanting and the growers assisted with labor requirements for planting.



Figure 4. Transplanting at the Lunenburg farm using a water wheel transplanter. Beds are spaced five feet apart with a staggered double row on each bed spaced 18" between plants and 14" between rows (11,600 plants/acre).

Table 2. Vegetable types and varieties used on-farm

Type	Variety	Seed Source	Descriptor	Plants/A
Jalapeno	Grande	Seigers	Hybrid, old standard	11,600
	El Jefe	Seigers	Hybrid, BLS1,2,3	"
	Pace 105	Campbell's	Hybrid, heatless	"
Habanero	Caribbean Red	Seigers	Open-pollinated	"
	Orange	Seigers	Open-pollinated	"
Tomatillo	San Juanito	Seigers	Open-pollinated	"

Establishment-



Figure 5. Tomatillos trellised using a basket weave system (upper left). Immature tomatillo enclosed by the husk (upper right). Developing habaneros (lower left) and developing jalapeno fruit (lower right).

Plant growth and vigor has been excellent for all crops tested. Tomatillo has a similar growth pattern as tomatoes and has required the use of trellising to keep the crop upright and off the ground. Potential yields are quite high as fruit has begun to set and flowering is prolific. The habaneros were the smallest transplants and required great care when planting keeping the small plants from getting covered by the plastic mulch. 2-3 weeks after transplanting they began to increase in size and currently demonstrate a much more compact growth habit with many branching laterals. Harvest is estimated to begin early August. The jalapenos were the sturdiest transplants and established quickly. Plant habit is branching with prolific flower buds emerging from growing tips. Harvest is estimated to begin mid-July. Production totals are unknown at this time, however, research from other areas suggest with our plant densities yields may range from 20-30 tons/A.

To date, no economical insect or pathogen pressure has been noted. Growers are following a preventive pesticide schedule to minimize pest generated loss.

Research Trials at SPAREC

Plots were established at Blackstone by soil fumigating with Pic-Plus (150 lbs/A) and laying black plastic mulch on May 5, 2006. All plots were planted on June 3, 2006. Overall objective for these trials is to evaluate cultural options to increase productivity of pepper and tomatillo production.

1. Jalapeno cultivar trial-
 - a. 7 cultivars of varying days to maturity to evaluate yield and season length. The experiment was arranged in a randomized complete block design with six replications.
2. Jalapeno plant spacing trial
 - a. The 3 cultivars used on-farm (Grande, El Jefe and Pace 105) were set at 12 and 18" in-row (17,400 and 11,600 plants/A respectively) to evaluate the effect of row spacing on yield. The experiment was arranged in a strip plot design with six replications.
3. Habanero variety and plant spacing trial
 - a. The 2 OP varieties (Caribbean red and orange) and a new hybrid (Orange Plum) were set at 12 and 18" in-row spacing (17,400 and 11,600 plants/A respectively) to evaluate the effect of row spacing on yield. The experiment was arranged in a strip plot design with six replications.
4. Tomatillo variety x plant spacing x trellising trial
 - a. San juanito and Supertillo were set at 12 and 18" in-row spacing (17,400 and 11,600 plants/A respectively) to evaluate the effect of row spacing on yield. A third factor, trellising, was introduced to evaluate the effect of using trellising on marketable yields. The experiment was arranged in a strip-split plot design with 4 replications.

The planting at SPAREC has been making similar progress as we have seen on the on-farm tests and crop development is consistent with the delayed planting date relative to the other sites. The varying planting dates will allow us to observe the fruiting patterns for potential season extension through planting dates.

Work is still on-going and harvest is about to begin in the upcoming month. Enterprise budgets will be generated based on the actual cost of production that has been incurred over this large scale project involving growers utilizing slightly different management strategies. Areas of future work will concentrate on developing a production system that increases grower adoption of these specialty crops particularly those currently growing tobacco. Row spacing has been the primary limitation and efforts will be directed at cultural systems that use 4 foot row spacing which is the conventional method for tobacco. We would also like to repeat the SPAREC trials from 2006 to address consistency of production results.

VDACS has been instrumental in providing support for this research endeavor which has directly impacted the potential future for viable diversification options for our Virginian growers. We look forward to continuing to work with VDACS to see this project through

to an end that consists of growers independently producing these specialty crops accomplishing farm diversification.